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AN EXPERIMENTAL SURVEY OF THE PERCEIVED QUALITY OF LIFE OF AIR FORCE PEOPLE.

James E. Judkins, Captain, USAF
Donald J. Webb, Captain, USAF

LSSR-7-78A

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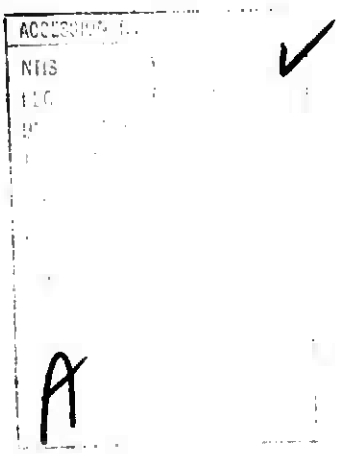

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☆ U.S. Government Printing Office: 1975-659-906
Region#5-11

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: LSSR 7-78A	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): AN EXPERIMENTAL SURVEY OF THE PERCEIVED QUALITY OF LIFE OF AIR FORCE PEOPLE	5. TYPE OF REPORT & PERIOD COVERED: Master's Thesis
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): James E. Judkins, Captain, USAF Donald J. Webb, Captain, USAF	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Graduate Education Division School of Systems and Logistics Air Force Institute of Technology, WPAFB OH	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Department of Research and Administrative Management AFIT/LSGR, WPAFB OH 45433	12. REPORT DATE: June 1978 13. NUMBER OF PAGES: 114
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report): UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

APPROVED FOR PUBLIC RELEASE AFR 190-17.

JERRAL F. GUESS, CAPT, USAF
Director of Information

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Quality of Life
Social Indicators
Social Environment
Environmental Impact
General Welfare

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Thesis Chairman: Patrick J. Sweeney, Lt Col, USAF

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This study examined the Quality of Life (QOL) of a randomly selected sample of military personnel assigned to Bergstrom AFB, TX and Lowry AFB, CO. A survey instrument was developed for this purpose. This study was designed to determine how different groupings of Air Force military personnel who were assigned to two bases which were located in two different Standard Metropolitan Statistical Areas (SMSA) perceived their QOL and to compare these perceptions to the QOL ratings produced by a model developed by Dr. Ben-Chieh Liu of the Mid-West Research Institute. Statistical analysis involved the use of factor analysis and standard frequency and crosstabs computer analysis products. The results of the study indicated that Dr. Liu's model was valid for these two SMSAs.

LSSR 7-78A

AN EXPERIMENTAL SURVEY OF THE PERCEIVED QUALITY OF LIFE OF AIR FORCE PEOPLE

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Facilities Management

By

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June 1978

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MASTER OF SCIENCE IN FACILITIES MANAGEMENT

DATE: 14 June 1978

COMMITTEE CHAIRMAN

READER

ACKNOWLEDGMENTS

We wish to thank Lieutenant Colonel Patrick J. Sweeney, our thesis chairman and Lieutenant Colonel Dale R. McKemey, our thesis reader, for supplying the necessary guidance throughout this research effort. Their encouragement and direction were instrumental in the successful completion of this thesis.

We owe a special thanks to Marianne Ramsey, our typist for preparing this thesis.

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Chapter 1

INTRODUCTION TO THE PROBLEM

Statement of the Problem

One of the major goals of Engineering and Services is to improve the quality of life (QOL) for all those who serve our country in the Air Force (AF). In the August, 1976 issue of Air Force Engineering and Services Quarterly, Major General Robert C. Thompson, Director of Engineering and Services, implored all personnel in Engineering and Services management to focus their attention on the quality of their product in terms of livability, aesthetics, and functionality (15:1). The General continued on to say,

> I would like to know that the talents, skills, and professional disciplines available . . . are being effectively employed to improve the quality of life for all Air Force people [15:1].

In the August, 1977 issue of Air Force Engineering and Services Quarterly the General again emphasized the Engineering and Services task of improving the environment in which all AF people live, work, and play (16:1).

According to Ms. Gretchen Van Hyning of Headquarters Air Force/PREVX, if engineering and services managers are to design effective and efficient programs to improve the QOL for all AF people, they must have a tool with which they can measure the perceived QOL.

Currently, Engineering and Services has no such tool. Thus, Engineering and Services needs to measure QOL as it is perceived by all AF people.

Definition of Terms

Quality of life. Each and every individual, whether he realizes it or not, has his own definition of the term QOL. He may not be able to pinpoint the exact definition, but his never ending striving for happiness indicates that he has identified those things which contribute to his happiness. Stanley M. Greenfield has stated,

> Quality of Life is a very personal expression of one's sense of well being. In a very real sense it expresses that set of 'things' which when taken in the aggregate, makes the individual happy [19:iii].

Fred S. Singer loosely defines QOL as,

> . . . having as much money as possible left over after taking care of basic necessities, and having the necessary time and opportunities for spending it in a pleasant way [19:I-5].

Dr. Ben-Chieh Liu has defined QOL as,

> . . . the output of a certain production function of two different but often interdependent input categories--physical inputs which are objectively measurable and transferable and the psychological inputs which are subjective, ordinally differentiable but usually not interpersonally comparable [20:12].

For the purposes of this thesis, QOL is defined as

> . . . a function of the objective conditions appropriate to a selected population and the subjective attitude toward those conditions held by persons in that population [19:I-4].

Standard metropolitan statistical area. A Standard Metropolitan Statistical Area (SMSA) is an economic entity which has a central city of at least 50,000 population. It normally contains several neighboring counties of related social, economic, political, and environmental characteristics (20:52).

> Geographically, the size of a metropolitan area is approximately traversable by automobile in much less than a day, i.e., a so-called 'commuting distance' [20:52].

Literature Review

Foundation. "Quality of life is a new name for the older terms general welfare or social well-being . . . [20:9]," and one of the goals of our Federal Government, as specified in the preamble to the Constitution, is to " . . . promote the general welfare . . . " of the American people (19:I-2). While our founding fathers did not define the term general welfare, they did recognize the need to gather information about the American people and included provisions for a national census in the Constitution. Thus, the United States (U.S.) became one

of the first countries to constitutionally acknowledge the fact that a government must gather information on its citizens in order to better govern them.

The National Environmental Policy Act (NEPA) reaffirms the preamble when it says,

> . . . it is the continuing policy of the Federal Government, in cooperation with the State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare . . . [5:710101].

While NEPA continues on to charge the Federal Government with providing safe, healthful, productive, and aesthetically and culturally pleasant surroundings for all Americans; it also directs our political leaders to achieve a balance between population growth and resource consumption in order to promote a higher standard of life (5:710101).

Executive Order (EO) 11514 directs the executive branch of the Federal Government to,

> . . . provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life [6:710121].

Federal programs. Based upon the legal foundation provided by the Constitution, NEPA, and EO 11514, the

Executive Branch of the Federal Government has established several organizations designed to improve the QOL of the American people. The purpose of the Bureau of Indian Affairs forest management program is to " . . . realize from the forest resources, the highest economic and social services for the Indian owners [7:514241]." One of the goals of the Fish and Wildlife Service is to provide for the protection and improvement of land and water environments for the direct benefit of nature and the indirect benefit of the quality of human life (8:514201). The Rural Electrification Administration, which was established during Franklin D. Roosevelt's "New Deal", radically changed the QOL of our Nation's farmers.

> At the outset of the New Deal, only one out of nine American farms had electricity; by the end of the Roosevelt era, eight out of nine enjoyed electric power [14:502].

In 1965, the Appalachian Regional Development Program was established to meet the specific needs of the Appalachian region and to improve the QOL of those who live in the region (9:510501).

Air Force programs. Within the AF, the Air Force Management Improvement Group (AFMIG) has surveyed AF military members, AF civilian employees, AF base commanders, and AF spouses to determine their perceptions towards job

satisfaction and life in the AF. The major thrust of the AFMIG efforts was directed towards determining how AF policies effect the way AF people view a work life dedicated to the AF (21). The Civil Engineering Center at Tyndall AFB FL, has conducted research to determine the critical aspects of livability as they pertain to residential, commercial, and community services; and the AF Civil Engineering School at Wright-Patterson AFB OH has placed major emphasis on livability and QOL in both the technical and management courses (12:6).

The AF Military Construction Program (MCP) has tremendous potential to improve the QOL of AF people. As a result, the AF has placed major emphasis on livability and QOL in the design criteria for those facilities constructed under the AF MCP. For example, one of the major goals in the design and construction of the new Air Force Accounting and Finance Center (AFAFC) located at Lowry AFB CO, was to provide a facility which would meet the mission requirements and at the same time satisfy the needs of the people who would work in the facility (13:7). The new Air Force Institute of Technology (AFIT) School of Systems and Logistics facility is another example of how the AF has used the MCP to improve the QOL

of AF people. As with the AFAFC, one of the major design considerations of the new AFIT facility was to satisfy the needs of those who would work and study in the new facility. Over the past several years the AF has managed a major housing and dormitory renovation and construction program, the purpose of which was to provide AF military personnel and their families a better place to live. While the major thrust of the AF efforts to improve QOL have been directed towards AF people, the Air Installation Compatible Use Zone (AICUZ) program has expanded the efforts to those areas of the civilian communities which are directly effected by AF activities such as flying and static engine testing.

The establishment of the Air Force Engineering and Services directorate in 1975 has probably been the most profound AF organizational change directed towards improving the QOL of AF people. The reorganization was an AF-wide effort aimed at achieving significant, visible, and tangible improvements in the QOL of AF people (17:1). Thus, the AF has begun treating QOL as a system of inter-related factors and has organized an organizational system to improve it.

Quality of life measurements.

> Economic indicators have traditionally been the principal measures of overall national prosperity and social well-being [20:14].

Such economic measurement systems as gross national product (GNP), real income per capita, unemployment rate, poverty level, and the stock market indices have been used not only as measurements of our Nation's economic status, but also as gross estimates of the QOL of our Nation's citizens. During the last 15 years, real income has grown at an unusually rapid rate; yet dissatisfaction with our Nation's social order of life has also grown tremendously (20:5). One should ask himself,

> . . . do the obvious manifestations of discontent in a rapid income-growing and highly affluent society simply misrepresent a general increase in contentment, or are there some people who have been made worse off as a consequence of economic growth [20:5]?

Economic growth, as it is known today, has almost always produced undesirable by-products. The rapid growth of our Nation's cities has been accompanied by air, water, and noise pollution, traffic congestion, crime, and urban decay. Since economic indicators generally have not considered the undesirable by-products of economic growth which do have a profound impact on QOL, such indicators, by themselves, have not provided a good measure of QOL.

The movement to develop a comprehensive measure of QOL is said to have begun in 1929 with President Hoover's Committee on Social Trends which attempted to analyze those social factors which were likely to affect public policy (20:7). However, little else was accomplished towards the goal of developing a comprehensive measure of QOL until the 1960s when an explosion of sorts occurred in the field of social science research. During the 1960s and early 1970s several economic, psychological, environmental, political, and sociological models were developed in an attempt to measure QOL. While such models did advance the research efforts directed towards a comprehensive measurement of QOL, they failed to provide such a measure for they, taken individually, considered only a portion of the system of factors which make up QOL (20:26).

The selection of a comprehensive, yet precise and manageable system of QOL factors is one of the principle problems faced by today's research community and several research efforts have been directed towards developing such a system (19:I-61). In 1969 Perloff developed a list of QOL factors which included:

1. the work place,
2. the household shelter,
3. the availability of transportation and utilities,

4. the community neighborhood,
5. the spatial environment, and
6. the natural environment (19:61).

In 1972 the Environmental Protection Agency (EPA) developed a list of factors which were classified into the following components:

1. The economic component which included such factors as income and economic security;

2. The political component which included such factors as civil liberties and government responsiveness;

3. The physical component which included such factors as housing and aesthetics;

4. The social component which included such factors as social stability and recreation;

5. The health component which included such factors as mental health and nourishment;

6. The natural environment component which included such factors as air quality and noise pollution.

The Office of Management and Budget also developed a list of QOL factors in 1972. This list of factors was classified into the following categories:

1. Employment,
2. Income,
3. Housing and physical environment,
4. Education,
5. Leisure and recreation,
6. Public safety and legal justice,
7. Health,
8. Population (19:66).

One of the more well known models which was designed to measure QOL as a system of interrelated factors was developed in 1975 by Ben-Chieh Liu, PhD, of the Mid-West Research Institute (20). While Dr. Liu stated that QOL is composed of two types of factors, the physical and psychological, he included only the physical factors in his model because he believed that the measurement of the psychological factors could only be accomplished on an ordinal scale and that such measurements could not be compared on an inter-personal basis. Dr. Liu's model contained 123 factors which were classified into the following components:

1. the economic component,
2. the political component,
3. the environmental component,
4. the health and education component, and
5. the social component (20:55).

Dr. Liu applied his model to 243 SMSAs within the United States and ranked each SMSA in all of the components covered by the model.

Even though Dr. Liu's model has been referred to as the state-of-the-art in man's attempt to quantify QOL, it has not been compared to a QOL index designed to measure peoples perceived QOL. It is possible that the

model's calculated and the populations perceived QOL are very close to the same level. However, they may not be at all close.

Research Objectives

The research objectives of this thesis were to:

1. Develop an instrument to measure the perceived QOL of AF military personnel.

2. Measure the perceived QOL of AF personnel who work at bases which are located within SMSAs.

3. Compare the measured perceived QOL:

   a. Between the bases under study.

   b. With the QOL calculated by Dr. Ben-Chieh Liu's model for each SMSA under study.

   c. Of those people who consider themselves to belong to racial minority groups to those people who classify themselves as being white (other than Spanish speaking origin).

Research Questions

The research questions were as follows:

1. What comparisons can be made between the sample's perceived QOL and the QOL calculated by Dr. Ben-Chieh Liu's model for each SMSA under study?

2. What comparisons can be made between the perceived QOL of different groups of AF personnel assigned to each base under study?

Chapter 2

RESEARCH DESIGN AND METHODOLOGY

The methodology of this research effort is explained in this chapter.

Universe

The universe of interest consisted of all commissioned AF officers and enlisted personnel assigned to bases located within SMSAs.

Population

There were two populations under study. They each consisted of all AF military members below the rank of Brigadier General assigned to either Bergstrom AFB, TX or Lowry AFB, CO. Each base was considered to constitute a separate population.

Sample

The sample was designed to consist of 150 members randomly drawn from each of the two populations. The AF Human Resources Laboratory at Brooks AFB, TX generated the sample and provided the researchers address labels for each member of the sample.

Base selection. Excluding AF Reserve and Air National Guard bases, there are 91 AF bases in the CONUS. Unlike a SMSA, an AF base is not a completely separate entity. A base interacts with its surrounding community and relies upon it to supply a variety of functions (1:4). "There is, in effect, a social, economic, political, and environmental contract between the base and its nearby community [1:4]." Two bases were randomly selected from among those bases which are located within SMSAs.

Data Collection Instrument

A questionnaire was distributed by mail to each member of the sample. This distribution method was employed because it provided the most representative sample at the most reasonable cost in terms of both time and money. Strict confidence of the respondent's identities was maintained at all times. No one was able tc link an individual's response to the individual.

In addition to the demographic data, the following five variables were measured by the instrument:

1. economic component,
2. political component,
3. environmental component,
4. health and education component, and
5. social component.

The above mentioned variables were taken from the model developed by Dr. Ben-Chieh Liu in his study entitled Quality of Life Indicators in U.S. Metropolitan Areas, 1970. A copy of the questionnaire is contained in Appendix A.

Demographic data. The data collected in this portion of the instrument determined:

1. a respondent's base of assignment;
2. a respondent's rank;
3. how long a respondent had been on station;
4. whether a respondent lived on base, owned off-base housing, or rented off-base housing;
5. a respondent's formal education level;
6. a respondent's race;
7. whether or not a respondent lived within the city limits of either Austin TX or Denver CO;
8. a respondent's marital status;
9. the number of dependents supported by a respondent; and
10. a respondent's sex.

The above mentioned data allowed the researchers to determine how different groupings of the sample perceived their QOL.

Economic component. The economic component questions were designed to measure the importance a respondent placed on his personal economic well-being and the economic well-being of the SMSA to which his base had been assigned. The questions were also designed to measure a respondent's perception of the SMSA's economic well-being. The individual questions were derived from Dr. Liu's model and several questionnaires developed by the AF Management Improvement Group.

Political component. The political component questions were designed to measure the importance a respondent placed on the various ways people who live and work in a metropolitan area can influence the political climate of the area. The questions were also designed to measure a respondent's perception of how well the people who live in the SMSA to which his base had been assigned can influence the political climate of that metropolitan area. These questions were derived from Dr. Liu's model.

Environmental component. The environmental component questions were designed to measure the importance a respondent placed on the quality of the natural environment in which he lived. The questions were also designed to

measure a respondent's perception of the quality of the natural environment surrounding the SMSA to which his base had been assigned. These questions were derived from Dr. Liu's model.

Health and education component. The health and education component questions were designed to measure the importance a respondent placed on those health and education services normally provided by a metropolitan area. The questions were also designed to measure the perceived quality of the formal health and education services provided by the SMSA to which a respondent's base had been assigned. These questions were derived from Dr. Liu's model.

Social component. The social component questions were designed to measure the importance a respondent placed on the following three central social issues as identified by Dr. Liu:

1. individual concerns,
2. individual equality,
3. community living conditions.

The questions were also designed to measure a respondent's perception of the quality of these issues in the SMSA to which his base had been assigned.

Individual concerns include the individual's opportunity for self-support, the promoting of maximum development of individual capability, and a widening opportunity for individual choice (19:69). Individual equality stems from our Nation's laws which state that all individuals are created equal and that no one shall be discriminated against based upon his race, creed, sex, or nationality. Community living conditions include housing, public transportation, utility service, crime rate, and the cost of living (20:72). These questions were derived from the model developed by Dr. Liu.

Data classification. The data collected in the administering of the questionnaire included both interval and nominal level information. The nominal level data consisted of the demographic information collected in the first part of the questionnaire. The interval level data included the responses to the remaining questions all of which had been placed on a five-point Likert Scale. The assumptions made concerning the validity of the interval level data of the Likert Scale are well supported by P. L. Gardner in his Review of Educational Research article, "Scales and Statistics." Mr. Gardner has stated:

> If a test is constructed by psychophysical scaling methods [the Likert Scale] . . . then, it is argued the measure possesses interval scale [10:46].

Questionnaire development. The questionnaire developed by the researchers was evaluated by HQ USAF/PREVX; the researchers thesis advisor, Lt Col Patrick J. Sweeney; and the thesis reader, Lt Col Dale R. McKemey. As a result of these evaluations, the researchers made several changes to the original questionnaire. These changes not only simplified the questionnaire but also increased its validity.

Instrument reliability. "Reliability is an indication of the extent to which a measure contains variable error [11:280]."

> Variable error is defined in terms of random fluctuations in performance which lead a person to get a different score from one testing session to another . . . [2:42].

Ideally, the reliability of the questionnaire would be determined using the test-retest approach on a pilot study group. However, time did not permit such a test. It was, therefore, assumed for the purposes of this research effort, that the instrument was reliable. It is hoped that the reliability of the questionnaire can be determined at a later date using the test-retest approach.

Instrument validity. According to Emory, "The . . . validity of a research design is its ability to measure what it aims to measure [5:120]." Excluding the demographic questions, all of the questions in the questionnaire were based on the model developed by Dr. Ben-Chieh Liu in his study entitled Quality of Life Indicators in U.S. Metropolitan Areas, 1970. The researchers thus believed there to be a certain amount of face validity to the questionnaire. The evaluation of the instrument by HQ USAF/PREVX and the faculty members of the Graduate Education Division, School of Systems and Logistics lended logical validity to the questionnaire. The researchers also applied factor analysis, a multivariate analysis technique, to analyze the responses received from the sample members. This technique was used to determine, from the actual responses received, whether or not the questions actually tested what they were designed to test. A copy of the factor analysis program used by the researchers is contained in Appendix B.

Factor Analysis

Major John E. Engel in his technical report entitled A Study of the Relationships Between Worker Attitudes and Organizational Effectiveness in an Air

Logistics Center Maintenance Directorate has presented an outstanding description of the factor analysis technique. Major Engel has stated that:

> Given an array of input variables, factor-analytic techniques enable one to see if some underlying pattern of relationships exists such that the data may be condensed or 'reduced' to some smaller set of factors that may be taken as source variables accounting for the interrelations in the data . . . [4:31].

Major Engel continued to say,

> Factor analysis is based on the proposition that if there is a systematic interdependence among variables, that it must be the result of some fundamental characteristics which underlie the commonality of such variables . . . [4:31].

The determination and identification or labeling of any common factors which may be extracted from the responses to a questionnaire usually involves the following three steps:

1. preparation of a correlation matrix,
2. extraction of the initial factors,
3. rotation of the factors to a maximally interpretable solution (4:31).

It is pointed out that factor analysis can only indicate underlying factors and that the technique cannot actually identify or label the factors. The determination of each factor is a subjective decision which must be made by the researcher.

Table 1 is an example of a correlation matrix for six questions (4:32).

Table 1

Correlation Matrix (4:32)

Question	Question					
	1	2	3	4	5	6
1	1.00	0.72	0.16	0.23	0.63	0.09
2	.72	1.00	.23	.35	.57	.15
3	.16	.23	1.00	.76	.21	.67
4	.23	.35	.76	1.00	.32	.81
5	.63	.57	.21	.32	1.00	.30
6	0.09	0.15	0.67	0.81	0.30	1.00

The matrix indicates that variable one is highly correlated with variables two and five, and that variable three is highly correlated with variables four and six (4:32). Thus, one would expect at least two factors to emerge from this particular analysis.

Table 2 is an example of a factor loading matrix which indicates the existence of two factors among six questions (4:33).

> The six figures directly under columns A and B are called the factor loadings and represent the correlations between the variables and the factors [4:33].

Factor A accounts for 49 percent ($.70^2 \times 100$) of the variance of question number two and factor B accounts for 21 percent ($.46^2 \times 100$) of the variance of question number two. The total variance of question number two which can be accounted for by both factors is called the communality and is designated by h^2 (4:34). In the case of question number two, the communality is .70 ($h^2 = .70^2 + .46^2 = .70$).

Table 2

A Factor Loadings Matrix (4:33)

Question	Factors		Communality (h^2)
	A	B	
1	0.71	0.40	0.66
2	.70	.46	.70
3	.69	-0.41	.64
4	.65	-0.43	.63
5	.70	.37	.61
6	0.71	-0.39	0.66
Eigenvalue	2.89	1.01	3.90
% of variance	0.48	0.17	0.65

The eigenvalue

> . . . is determined by summing the squares of each of the loadings on a factor and indicates the amount of total variance in the data that that factor accounts for [4:34].

The eigenvalue for factor A is 2.89 ($2.89 = .71^2 + .70^2 + .69^2 + .65^2 + .70^2 + .71^2$). The number obtained by dividing a factor's eigenvalue by the number of variables shows the percent of the total variance accounted for by that particular factor (4:34). "Factor A, therefore, accounts for 48 percent of the variance in the data, while factor B accounts for 17 percent [4:34]." Table 2 indicates that factors A and B together account for 65 percent of the variance in the data " . . . which means that 35 percent of the variance is to be found in other factors [4:34]."

The eigenvalue is an extremely important number because it is used to select those factors which contribute most to the reduction in the number of variables. ". . . The factors which are normally considered meaningful are those whose eigenvalues are greater than one [4:34]." The logic behind selecting only those factors whose eigenvalues are greater than one is as follows:

> . . . at the point where the variance explained by additional factors is less than one, the total variance explained by the factor is less than the variance explained by an original variable. The number of factors to be considered for further analysis, therefore, is commonly determined by the eigenvalues [4:35].

It is often difficult if not impossible to interpret the underlying meaning of those factors which a researcher may want to analyze. Thus, the process of factor rotation is normally used to clarify the meaning of the factors (4:35).

> . . . Factor rotation is something like staining a microscopic slide. Just as different stains reveal different tissue structures, different rotations reveal different structures in the data, even though in both cases the structures were always there . . . [4:35].

The orthogonal varimax rotation and the oblique rotation schemes are the two most commonly used rotation methods in attitude measurement research (4:35). The orthogonal varimax method produces uncorrelated factors by simplifying the columns of a factor matrix while the oblique method allows correlation among the factors and produces more empirically realistic factors (4:35). Several groups of questions in the questionnaire were purposefully designed to measure the same factors. Thus, the researchers expected correlation among these factors and used the oblique rotation scheme to allow for this correlation.

Table 3 is just a portion of an unrotated factor matrix which indicates the existence of ten factors among four variables. The factors appear to be correlated since none of the four variables load heavily on any of the

Table 3

Part of a Factor Loading Matrix for 72 Variables (Unrotated)

Variable	FACTORS				
	1	2	3	4	5
1	0.10279	0.29253	0.07704	0.01586	0.14034
2	0.22883	0.22750	0.00317	0.08745	0.1836,
3	0.15818	0.21880	0.11982	0.18323	0.13541
4	0.18511	0.12461	0.07780	0.02616	0.02472

Variable	FACTORS				
	6	7	8	9	10
1	0.10028	0.02419	0.26264	0.27098	0.06264
2	0.05114	0.02281	0.32311	0.22305	0.00598
3	0.02424	0.13966	0.37465	0.29677	0.19260
4	0.16107	0.28985	0.33564	0.24154	0.07934

ten factors. Table 4 depicts the results of an oblique rotation of the data contained in Table 3. The oblique factor matrix clearly indicates that variables Q1 through Q4 load on the eighth factor and that these questions tend to measure the same thing or concept.

Statistical Tests

The raw data were received from the respondents on standard mark-sense scanner answer sheets. The responses were read into a computer data file using the equipment available in the computer support section, School of Systems and Logistics. Descriptive statistics were generated from this file using the frequencies and crosstabs subprograms of the Statistical Package for the Social Sciences (SPSS) package. It is hoped that the descriptive statistics will be used in the future to determine whether or not parametric statistical techniques can be applied in an analysis of the data. Copies of a typical frequencies program are contained in Appendix B.

Data analysis. Excluding the demographic questions, all of the questions were placed on a five-point Likert Scale. The arithmetic means of the responses to each group of questions designed to measure how the samples under study

Table 4

Part of a Factor Loading Matrix for 72 Variables (Rotated)

Variable	FACTORS				
	1	2	3	4	5
1	0.07678	0.03697	0.08402	0.02951	0.29115
2	0.02532	0.01105	0.05324	0.00304	0.18450
3	0.04914	0.01868	0.06209	0.11295	0.16379
4	0.05089	0.05546	0.15192	0.00159	0.03972

Variable	FACTORS				
	6	7	8	9	10
1	0.01604	0.03978	0.40173	0.02509	0.00629
2	0.02364	0.10148	0.44232	0.08900	0.14535
3	0.03559	0.01714	0.60849	0.12024	0.11884
4	0.08591	0.19625	0.59930	0.04424	0.08530

perceived each of the five components of the SMSA's QOL were used to determine how each sample, as a whole, perceived each QOL component. These component means were then used to calculate the mean response to all of the questions which were designed to measure QOL. This overall mean showed how the samples, as a whole, perceived its overall QOL. The arithmetic mean was used because it is normally the most appropriate measure of the central tendency of interval level data (3:117). Table 5 depicts the verbal description assigned to each of five intervals of the Likert Scale for those questions which measured QOL.

The arithmetic mean of the responses to these groups of questions designed to measure the level of importance each respondent placed on each component of an area's QOL were also computed. Table 6 depicts the verbal description assigned to each of five intervals of the Likert Scale for those questions which measured importance. Table 7 provides a cross-reference between the various descriptive scales. All of the above mentioned mean values were computed using the data generated by the frequencies subprogram of SPSS and a programmable pocket calculator. The program used by the researchers is contained in Appendix B.

Table 5

Mean Values and Their Description--QOL Scale

Mean Value (M)	Description
$M < 1.06$	unsatisfactory range
$1.06 \leq M < 2.12$	unsatisfactory to satisfactory range
$2.12 \leq M < 3.18$	satisfactory range
$3.18 \leq M < 4.24$	satisfactory to excellent range
$4.24 \geq M$	excellent range

Table 6

Mean Values and Their Descriptions--Importance Scale

Mean Value (M)	Description
$M < 1.06$	unimportant range
$1.06 \leq M < 2.12$	unimportant to moderately important range
$2.12 \leq M < 3.18$	moderately important
$3.18 \leq M < 4.24$	moderately to very important range
$4.24 \geq M$	very important range

Table 7

Rating Scales

Thesis Satisfaction Ratings	Thesis Importance Ratings	Dr. Liu Ratings
Unsatisfactory	Unimportant	Substandard
Unsatisfactory to Satisfactory	Unimportant to Moderately Important	Adequate
Satisfactory	Moderately Important	Good
Satisfactory to Excellent	Moderately to Very Important	Excellent
Excellent	Very Important	Outstanding

Assumptions

The assumptions under which this research was conducted were as follows:

1. The definitions and assumptions from supportive research are valid and reasonable.

2. The full cooperation of the selected sample resulted in the return of accurate and valid data.

3. The questionnaire was reliable.

Limitations

The limitations under which this research was conducted were as follows:

1. The conclusions reached through this research effort could be generalized only to the two samples under study. The results should not be generalized to any other group of AF military personnel unless the reader has reason to believe that one of the populations is representative of the other group.

2. Only limited testing of the questionnaire's validity was feasible prior to data collection.

3. The small sample size and the fact that the two samples were drawn from two different SMSA categories (large and medium) prohibited any statistically significant comparisons between the two samples.

Chapter 3

ANALYSIS AND RESULTS OF THE QUALITY OF LIFE SURVEY

Survey Approval and Data Collection

The original research design and methodology was far more complex and comprehensive than the methodology presented in Chapter 2. The original research objectives were to:

1. Develop an instrument to measure the perceived QOL of AF people.

2. Measure the perceived QOL of AF people who work at bases which are located within SMSAs.

3. Compare the measured perceived QOL:

   a. among seven AF bases,

   b. with the QOL calculated by Dr. Ben-Chieh Liu's model for each SMSA under study,

   c. of AF civilian employees to the perceived QOL of AF military people at each bases under study,

   d. of field grade officers to the perceived QOL of company grade officers at each base under study,

   e. of senior enlisted members to the perceived QOL of junior enlisted members at each base under study,

   f. of higher grade civilian employees to the perceived QOL of lower grade employees at each base under study.

The original sampling plan called for a simple random selection of all military personnel (Colonel and below)

and a simple random selection of all civilian employees (GS, WG, WS, WL) grade 15 and below at each of the seven original bases under study.

Because of several pending Air Force surveys, the researchers were not granted approval to survey civilian personnel or to survey military personnel to the extent proposed. The number of bases surveyed was reduced from seven to two and the number of military personnel to be surveyed was reduced to 150 per base. These constraints had the following effects on the research effort:

1. The researchers had to reduce the scope of the research and to realign the research objectives.

2. The quantitative methods necessary to analyze the data were simplified.

3. The researchers were able to perform a factor analysis of all of the responses received from the field since the size of the memory space in the computer available to the researchers was large enough to analyze the small number of responses.

The AF Human Resources Laboratory, Brooks AFB, TX, provided the researchers the names of 150 and 300 randomly selected military members at Lowry AFB and Bergstrom AFB, respectively. The Laboratory provided 300 names for Lowry AFB because it was unable to separate the permanent

party members from the students and wanted to ensure that at least 150 permanent party members were selected. The researchers developed a way to identify the permanent party members at Lowry AFB and distributed a total of 300 questionnaires to the field. Four of the 155 responses which were received in time for analysis indicated that the individuals were assigned to bases other than the two under study. The discarding of these four responses produced an effective return rate of 44 percent for Bergstrom AFB and 56.7 percent for Lowry AFB. (See Table 8).

Demographic Characteristics of the Respondents

The detailed demographic characteristics of the 151 respondents are contained in Appendix C. In general, the majority of the respondents were enlisted members who had been assigned to their bases for fewer than four years and who had had some undergraduate education. Twenty percent of the respondents considered themselves to belong to a racial minority group. Twenty-seven percent of the respondents lived on-base, thirty-nine percent owned off-base housing and thirty-four percent rented off-base housing. Fifty-eight percent of the respondents lived within the city limits of either Austin TX or Denver CO and over seventy-seven percent of the respondents were married.

Table 8

Response Data

	Bergstrom AFB	Lowry AFB	Total
No. of questionnaires distributed	150	150	300
No. of responses received in time for analysis			155
No. of responses deleted from analysis			-4
No. of responses from each base	85	66	151
Effective response rate	44%	56.7%	51.7%

Factor Analysis

The first factor analysis of the data produced a total of 20 factors among the 72 questions which were designed to measure either how the respondents perceived each of the five components of their QOL or the level of importance the respondents placed on each of these components. Analysis of these 20 factors was next to impossible as many of the questions loaded on several factors instead of just one or two. The researchers forced the factor analysis program to produce different numbers of factors in an attempt to clarify the factor loading matrix and found that ten factors and the oblique rotation scheme produced the clearest factor loadings and most distinct groupings of the questions. Table 9 depicts the ten groups of questions in the questionnaire and what they were designed to measure. Table 10 depicts the ten factors produced by the factor analysis program and the questions contained in each factor. Table 11 depicts the names of the ten factors and what they measured. Table 12 depicts those questions which apparently either measured more than they were designed to measure or measured something entirely different from what they were designed to measure. Only three of the questions which were designed to measure the components of QOL did not load strongly on the factors or

Table 9

Question Groups

Question	Group No.	Concept Measured
12 through 17	1A	Importance respondent placed on economic component
18 through 22	1B	Economic component of QOL
23 through 31	2A	Importance respondent placed on political component
32 through 39	2B	Political component of QOL
40 through 45	3A	Importance respondent placed on environmental component
46 through 50	3B	Environment component of QOL
51 through 57	4A	Importance respondent placed on health and education component
58 through 63	4B	Health and education component of QOL
64 through 73	5A	Importance respondent placed on social component
74 through 83	5B	Social component of QOL

Table 10

Factor Matrix

Factor	Questions
1	54 through 63, 69
2	74 through 78, 80 through 83
3	23 through 28
4	37, 38, 64 through 66, 70 through 73
5	18 through 22, 79
6	46 through 50
7	29 through 31, 51, 53, 67 through 69
8	12 through 17
9	32 through 36, 39
10	40 through 45, 52

Table 11

Factor Identification

Factor	Factor Title	Concept Measure
1	4 A & B Health & Education	1. The importance of the Health and Education component 2. The QOL level of the Social component
2	5 B Social	The perceived QOL level of the Social component
3	2 A Political	The importance of the Political component
4	5 A Social-Economic	The economically oriented question of those which measured the importance of the Social component
5	1 B Economic	The perceived QOL level of the Economic component

Table 11 (continued)

Factor	Factor Title	Concept Measure
6	3 B Environmental	The perceived QOL level of the Economic component
7	5 A Social-Government Services	The importance of governmental services in contributing to the importance of the Social component
8	1 A Economic	The importance of the Economic component
9	2 B Political	The perceived QOL level of the Political component
10	3 A Environmental	The importance of the Environmental component

Table 12

Component Comparison

Question	Design Component	Actual Component Description
37 & 38	2 B, Political component of QOL	5 A The effect economic considerations have on the Social component of QOL
29 through 31	2 A, The importance of the Political component of QOL	5 A The effect of governmental services on the importance of the Social component of QOL
51 & 53	4 A, The importance of the Health and Education component of QOL	5 A The effect of governmental services on the importance of the Social component of QOL
67 through 69	5 A, The importance of the Social component	5 A The effect of governmental services on the importance of the Social component of QOL
64 through 62 70 through 73	5 A, The importance of the Social component	5 A The effect economic considerations have on the importance of the Social component of QOL

Table 12 (continued)

Question	Design Component	Actual Component Description
69	5 A, The importance of the Social component	4 A & B Both the importance and the level of the Health and Education component of QOL
79	5 B, The Social component of QOL	1 B The Economic component of QOL

concepts they were designed to measure. Questions 37 and 38 asked the respondent to rate the quality of the local police protection and local fire protection, respectively. However, for some reason these two questions tended to measure the effect that economic considerations have on the importance of the social component of a SMSA's QOL. Question 79 asked the respondent to rate the crime rate in the metropolitan area around his base. However, the responses to this question indicated that it was associated with and measured the quality of the economic component of a SMSA's QOL.

In view of the above situation in which all but three of those questions which were designed to measure specific components of an SMSA's QOL did so, the researchers opine that the questionnaire did accurately measure the sample's perceived QOL.

The remaining questions which did not fully measure what they had been designed to measure fell into the category of questions which were designed to measure the importance a respondent placed on the five components of a SMSA's QOL. Most of these questions tended to measure a portion of the importance the respondents placed on the social component. This phenomenon did not surprise the

researchers for they had specifically designed the social component questions to measure more than the social component.

Analysis of the Quality of Life Components

Table 13 depicts the mean responses and the QOL ratings of all of the respondents at Lowry AFB. These respondents perceived their QOL to be just slightly lower than the level calculated by Dr. Liu's model in the political, health and education, and social components. The overall perceived QOL was also slightly lower than Dr. Liu's overall rating.

Table 14 depicts the mean responses and the QOL ratings of the enlisted respondents at Lowry AFB. These respondents perceived their QOL to be slightly lower than the level calculated by Dr. Liu in the political, and health and education components. However, the overall perceived QOL of the enlisted members did agree with Dr. Liu's overall rating.

Table 15 depicts the QOL ratings of the respondents at Lowry AFB who considered themselves to belong to a racial minority group. These respondents perceived their QOL to be slightly lower than the level calculated by Dr. Liu in the health and education component, and the

Table 13

QOL of Everyone at Lowry AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.80	Satisfactory	Good
Political	3.17	Satisfactory	Excellent
Environmental	3.15	Satisfactory	Good
Health and Education	3.69	Satisfactory to Excellent	Outstanding
Social	3.49	Satisfactory to Excellent	Outstanding
Overall QCL	3.29	Satisfactory to Excellent	Outstanding

Table 14

QOL of Enlisted Personnel at Lowry AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.77	Satisfactory	Good
Political	3.17	Satisfactory	Excellent
Environmental	3.12	Satisfactory	Good
Health and Education	3.67	Satisfactory to Excellent	Outstanding
Social	3.51	Satisfactory to Excellent	Outstanding
Overall QOL	3.29	Satisfactory to Excellent	Outstanding

Table 15

QOL of Minority Groups at Lowry AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.57	Satisfactory	Good
Political	3.24	Satisfactory to Excellent	Excellent
Environmental	3.04	Satisfactory	Good
Health and Education	3.57	Satisfactory to Excellent	Outstanding
Social	3.26	Satisfactory to Excellent	Outstanding
Overall QOL	3.18	Satisfactory to Excellent	Outstanding

social component. The overall perceived QOL was also slightly lower than Dr. Liu's overall rating.

Table 16 depicts the QOL ratings of those respondents at Lowry AFB who did not consider themselves members of a racial minority group. As with the minority groups, these respondents perceived their QOL to be slightly lower than the level calculated by Dr. Liu in the health and education, and social components. The overall perceived QOL of this group of respondents was also slightly lower than Dr. Liu's overall rating.

Table 17 depicts the QOL ratings of all of the respondents at Bergstrom AFB. These respondents rated the political component much higher than Dr. Liu and the environmental component slightly higher than Dr. Liu. However, the respondent's overall perceived QOL agreed with Dr. Liu's overall rating.

Table 18 depicts the QOL ratings of the enlisted respondents at Bergstrom AFB. The respondents rated the political and environmental components slightly higher than did Dr. Liu. However, the overall rating of the respondents agreed with Dr. Liu's overall

Table 19 depicts the QOL ratings of those respondents at Bergstrom who considered themselves to belong to a racial minority group. These respondents rated the

Table 16

QOL of Whites at Lowry AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.85	Satisfactory	Good
Political	3.15	Satisfactory	Excellent
Environmental	3.17	Satisfactory	Good
Health and Education	3.79	Satisfactory to Excellent	Outstanding
Social	3.56	Satisfactory to Excellent	Outstanding
Overall QOL	3.33	Satisfactory to Excellent	Outstanding

Table 17

QOL of Everyone at Bergstrom AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.90	Satisfactory	Good
Political	3.19	Satisfactory to Excellent	Adequate
Environmental	3.89	Satisfactory to Excellent	Adequate
Health and Education	3.84	Satisfactory to Excellent	Excellent
Social	3.37	Satisfactory to Excellent	Excellent
Overall QOL	3.42	Satisfactrry to Excellent	Excellent

Table 18

QOL of Enlisted Personnel at Bergstrom AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.82	Satisfactory	Good
Political	3.16	Satisfactory	Adequate
Environmental	3.79	Satisfactory to Excellent	Adequate
Health and Education	3.79	Satisfactory to Excellent	Excellent
Social	3.31	Satisfactory to Excellent	Excellent
Overall QOL	3.36	Satisfactory to Excellent	Excellent

Table 19

QOL of Minority Groups at Bergstrom AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	3.03	Satisfactory	Good
Political	3.13	Satisfactory	Adequate
Environmental	4.14	Satisfactory to Excellent	Adequate
Health and Education	4.10	Satisfactory to Excellent	Excellent
Social	3.54	Satisfactory to Excellent	Excellent
Overall QOL	3.56	Satisfactory to Excellent	Excellent

environmental component significantly higher than did Dr. Liu and the political component slightly higher. Again, the respondents' overall QOL rating agreed with Dr. Liu's overall rating.

Table 20 depicts the QOL ratings of those respondents at Bergstrom who did not consider themselves to be members of a racial minority. These respondents rated both the political and environmental components significantly higher than did Dr. Liu. However, the respondents overall rating again agreed with Dr. Liu's overall rating.

Comparisons. In comparing the ratings of those respondents who consider themselves to belong to racial minority groups to the ratings of those respondents who did not consider themselves to belong to such groups the researchers found the following:

1. The minority groups at Lowry AFB rated four out of the five components lower than did the non-minority group. The political component was the only component which was rated higher by the minority groups. Thus, the overall QOL of the minority groups was lower than the overall QOL of the non-minority group.

2. The minority groups at Bergstrom AFB rated four out of the five components higher than did the non-minority

Table 20

QOL of Whites at Bergstrom AFB

Component	Questionnaire Results		Dr. Liu's Rating Range
	Mean Response	Rating Range	
Economic	2.86	Satisfactory	Good
Political	3.22	Satisfactory to Excellent	Adequate
Environmental	3.81	Satisfactory to Excellent	Adequate
Health and Education	3.76	Satisfactory to Excellent	Excellent
Social	3.32	Satisfactory to Excellent	Excellent
Overall QOL	3.38	Satisfactory to Excellent	Excellent

group. The political component was the only component which received a lower rating from the minority groups than it did from the non-minority group.

In comparing the ratings of the total sample at Bergstrom AFB to the ratings of the total sample at Lowry AFB the researchers found that the Bergstrom sample rated four of the components higher than did the Lowry sample and that the Bergstrom overall QOL rating was higher than the Lowry overall QOL rating. The social component was the only component which received a lower rating from the Bergstrom sample than it did from the Lowry sample.

In comparing the ratings of the enlisted personnel at Bergstrom AFB to the ratings of the enlisted personnel at Lowry AFB the researchers found that the Bergstrom group rated three of the five components higher than did the Lowry group. Both groups rated the political component at the same level. The social component was the only component which received a lower rating from the Bergstrom group than it did from the Lowry group.

In comparing the component and overall QOL ratings of the two samples to Dr. Liu's ratings the researchers found the following:

1. There were 20 possible comparisons between the component ratings of the four groups (Tables 13 through 16) at Lowry AFB and Dr. Liu's component ratings for the Denver SMSA. Of these 20 possible comparisons, ten agreed in that they fell into the same rating ranges and ten differed slightly in that Dr. Liu rated the components slightly higher than did the respondents.

2. There were also 20 possible comparisons between the four groups at Bergstrom AFB (Tables 17 through 20) and Dr. Liu's component ratings for the Austin SMSA. Of these 20 possible comparisons, 12 agreed in that they fell into the same rating ranges, four differed slightly in that Dr. Liu rated them one rating range lower than did the respondents, and four differed rather significantly in that Dr. Liu rated them two rating ranges lower than the respondents.

3. There were eight possible comparisons between the overall QOL of the eight groups at both Bergstrom AFB and Lowry AFB. Of these eight possible comparisons, four agreed in that they fell into the same rating ranges, four disagreed slightly in that Dr. Liu's overall ratings were one rating level higher than that of the respondents.

Analysis of the Importance Ratings

Appendix E contains the data which depict the level of importance each group of the populations placed on each of the five QOL components. In general, the respondents tended to rate each component quite high on the importance scale and no group rated any of the components below the moderately to very important rating range. Table 21 depicts the mean responses (by component) for all of the eight groups of the populations.

Table 21

Mean Importance Ratings

Component	Mean Response	Rating Range
Economic	3.95	Moderately to Very Important
Political	3.41	Moderately to Very Important
Environmental	4.32	Very Important
Health and Education	4.20	Moderately to Very Important
Social	4.13	Moderately to Very Important

Chapter 4

SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR FURTHER STUDY

Summary

This study was designed to determine how different groupings AF military personnel who were assigned to two bases which were located in two different Standard Metropolitan Statistical Areas perceived their Quality of Life and to compare these perceptions to the Quality of Life ratings produced by a model developed by Dr. Ben-Chieh Liu of the Mid-West Research Institute. The study measured the QOL of the two different metropolitan areas by determining how the 151 respondents to a survey questionnaire rated each of the following five components which have been held to comprise a metropolitan area's QOL:

1. the economic component,
2. the political component,
3. the environmental component,
4. the health and education component,
5. the social component.

The researchers developed the data gathering instrument as part of this thesis effort; and used the frequencies and crosstabs programs contained in the Statistical Package for the Social Sciences computer program

library to analyze the data. The researchers were able to determine how different groupings of the sample perceived each of the five components of a metropolitan area's quality of life and to make comparisons among the groups. The researchers were also able to compare the samples' perceived QOL to the QOL calculated by Dr. Ben-Chieh Liu.

Conclusions

Those questions which were designed to measure the perceived quality of life were proven valid through the use of factor analysis. Thus, the questions actually measured what they were designed to measure.

Several of the questions which were designed to measure the level of importance each respondent placed on each of the five QOL components were shown, through factor analysis, not to measure what they had been designed to measure. Thus, the validity of these questions was considered suspect.

On the whole, the two samples and all of the different groupings of the samples tended to rate their QOL slightly lower than Dr. Liu did. However, there was a good deal of agreement between the respondents' perception of their QOL and the QOL ratings computed by Dr. Liu in that both ratings always appeared on the same end of

the scales used to measure QOL. Dr. Liu rated both the Denver and Austin SMSAs high and so did the majority of the respondents. Thus, this paralleling of the two rating schemes lends support to the accuracy and validity of Dr. Liu's model. However, greater validity may have been obtained if one base had been in an SMSA that Dr. Liu had rated high, and the other base in an SMSA that Dr. Liu had rated low. Sampling from two SMSAs that were rated high may have prejudiced the results to some extent.

While the vast majority of the various groupings of the two samples tended to rate their QOL in the same rating range, there were some noticeable differences among the mean responses of the groups. The minority groups at Lowry AFB appeared to perceive that their QOL was lower than the QOL of the non-minority group. The converse occurred at Bergstrom AFB where the minority groups rated their overall QOL higher than did the non-minority group. While the total sample at each of the two bases rated their overall QOL quite high, the Bergstrom sample appeared to be more satisfied with its overall QOL than was the Lowry sample.

Recommendation

Several unfortunate events occurred during the course of this study which prevented the use of parametric

statistics and the application of a specific level of confidence to the researchers' conclusions. The researchers, therefore, recommend that individuals at a higher level of command evaluate the questionnaire; make the revisions they deem necessary; and conduct an AF wide survey of all AF personnel (military, civilian, and dependents) who are assigned to AF bases located within or near SMSAs. The sample should be designed as to provide for a reasonably high level of confidence and the determination as to whether or not the application of parametric statistical techniques is appropriate. This survey should also be designed to use statistical techniques to verify the reliability and accuracy of Dr. Liu's model. The researchers recommend that the new survey use the Likert scale, but that the scale ratings correspondent to Dr. Liu's, i.e., ratings range from substandard to outstanding.

Regardless of whether or not a second administration of the questionnaire proves or disproves the reliability and accuracy of Dr. Liu's model, the researchers recommend that AF Civil Engineering and Services establish a systematic program to measure the QOL of AF people. If Dr. Liu's model is found to be reliable and accurate, AF Civil Engineering and Services might find the development

and application of a similar model specifically designed for AF people to be cost effective. Such a model could be applied to each base at regular time intervals and the information gained from the model could be used by the base commanders and civil engineers to improve the QOL of the AF people at their bases. Should Dr. Liu's model be proven unreliable or inaccurate; or should the development of a model specifically for AF bases prove too expensive; the researchers recommend that regular QOL surveys be conducted at each base. As with the model approach, the information gained from these surveys could be used by the base commanders and civil engineers in their efforts to improve the QOL of the AF people at their bases.

Since the samples' perceived QOL tended to agree with the results of Dr. Liu's model the researchers recommend, pending implementation of the preceding two recommendations, that AF Civil Engineering and Services utilize Dr. Liu's model as an indicator of those areas where the AF should concentrate its current efforts to improve the QOL of those bases which are either located within or adjacent to an SMSA.

Factor analysis showed those questions which were designed to measure the level of importance each respondent placed on each of the five QOL components to be less than

satisfactory. The researchers, therefore, recommend that a student team in one of the following classes revise these questions, conduct a pilot study, and attempt to increase the validity of the questions. The above effort could be accomplished as a project in one of the quantitative courses.

Final Thoughts

The quality of life concept is extremely elusive and the measurement of this concept is even more elusive. However, the age of limited cost-of-living pay increases, the apparent erosion of benefits, and the end of the draft have, in the opinion of the researchers, mandated that the AF discover new ways to motivate qualified people to make the AF more than just a job in which one sells his services to the highest bidder.

One of the major goals of AF Engineering and Services is to improve the QOL of all AF people in order to make the AF way of work and life more attractive and livable. Thus, AF Engineering and Services is playing a major role in motivating qualified people to view serving our country in the AF as a career and profession instead of as just a job. However, if Engineering and Services managers are to design effective and efficient programs to

improve the QOL of AF people, they must have a way of measuring how AF people perceive QOL so that they may concentrate their efforts in those areas which will produce the greatest beneficial results. In short, Engineering and Services managers need to measure QOL so that they can attain the best results within the funding constraints imposed upon the AF.

APPENDIX A

METROPOLITAN QUALITY OF LIFE SURVEY

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: LSGR (LSSR 7-78A/Capt Webb/1st Lt Judkins/AUTOVON 785-6513)

SUBJECT: Metropolitan Quality of Life Survey

APR [illegible]

TO:

1. The attached questionnaire was prepared by a research team at the Air Force Institute of Technology, Wright-Patterson AFB OH. The purpose of this survey is to acquire data on how Air Force people perceive several factors which contribute to urban quality of life.

2. You are requested to provide an answer for each question. Headquarters USAF Survey Control Number 78-80 has been assigned to this questionnaire. Your participation in this research is voluntary.

3. Your responses to the questions will be held confidential. Please remove this cover sheet before returning the completed questionnaire. Your cooperation in providing this data will be appreciated and will be very beneficial in examining the urban quality of life. Please return the completed questionnaire in the attached envelope within one week after receipt.

HENRY W. PARLETT, Colonel, USAF
Associate Dean for Graduate Education
School of Systems and Logistics

2 Atch
1. Questionnaire
2. Return Envelope

Strength Through Knowledge

PURPOSE OF THIS SURVEY

This questionnaire is part of a research study of metropolitan life and people's perceptions of several factors which contribute to life in a metropolitan area. The research is being conducted by Captain Donald J. Webb and First Lieutenant James E. Judkins of the Air Force Institute of Technology's Graduate School of Systems and Logistics. The purpose of the research is to find out how Air Force people perceive several factors which, in theory, contribute to the quality of life in a metropolitan area.

Please answer the questions on the following pages as honestly and candidly as possible. Indicate how you really feel about the subject. In no way will your responses be traceable to you as an individual, nor will any attempt be made to do so. There are no "trick" questions.

Keep in mind that this is not a test and that there are no "correct" or "incorrect" answers. We want your honest opinion.

There are a total of 83 questions on this survey questionnaire. When you have completed the survey, please place the answer form in the pre-addressed envelope and place it in the base distribution system. You need not place postage on the envelope.

In advance, thank you for your participation in this study. It is by your cooperation that we hope to advance our understanding of the management process.

USAF SCN 78-80 (Expires 15 June 1978)

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

(1) 5 U.S.C. 301, Departmental Regulations, and/or

(2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or

(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

PLEASE READ THE FOLLOWING INSTRUCTIONS
BEFORE ANSWERING THE SURVEY

Answer the questions as of January 1978.

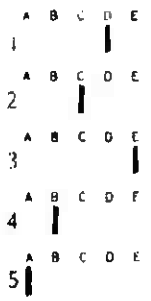
Select only one answer to each question.

Mark your answers on the answer sheet.

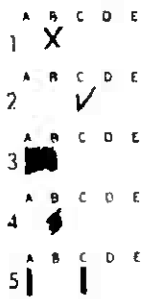
Be sure to mark your answers carefully so that you enter them opposite the same answer sheet number as survey question number.

Be sure that your answer marks are heavy and black and that you blacken the whole rectangle but stay within the rectangle lines. Do not use a ball point pen. Use a No. 2 pencil only.

RIGHT WAY TO MARK ANSWER SHEET



WRONG WAY TO MARK ANSWER SHEET



DO NOT ENTER YOUR SOCIAL SECURITY ACCOUNT NUMBER in the boxes indicated on the front of the answer sheet even though it says to do so. Do not sign the answer sheet or identify yourself as an individual in any way.

When you have completed the questions, please place your answer sheet in the pre-addressed envelope that has been provided and mail it as soon as possible through normal distribution channels.

Thank you for your cooperation in completing this research effort.

1. What is your current base of assignment?

(a) Andrews AFB, MD
(b) Kelly AFB, TX
(c) Lowry AFB, CO
(d) Wright-Patterson AFB, OH
(e) Bergstrom AFB, TX
(f) Nellis AFB, NV
(g) Peterson AFB, CO

Civilian personnel please mark 7 in question 2 and answer question 3; military personnel please mark 7 in question 3 and answer question 2.

2. What is your present active duty grade?

(a) Colonel
(b) Lieutenant Colonel
(c) Major
(d) Captain
(e) First Lieutenant
(f) Second Lieutenant
(g) Chief Master Sergeant
(h) Senior Master Sergeant
(i) Master Sergeant
(j) Technical Sergeant
(k) Staff Sergeant
(l) Sergeant
(m) Senior Airman
(n) Airman First Class
(o) Airman
(p) Airman Basic
(7) Civilian

3. What is your present pay grade?

(a) GS-16
(b) GS-15
(c) GS-14
(d) GS-13
(e) GS-12
(f) GS-11
(g) GS-10
(h) GS-09
(i) GS-08
(j) GS-07
(k) GS-06
(l) GS-05
(m) GS-04
(n) GS-03
(o) GS-02
(p) GS-01
(q) WS or WL or WG-15
(r) WS or WL or WG-14
(s) WS or WL or WG-13
(t) WS or WL or WG-12
(u) WS or WL or WG-11
(v) WS or WL or WG-10
(w) WS or WL or WG-09
(x) WS or WL or WG-08
(y) WS or WL or WG-07
(z) WS or WL or WG-06
(0) WS or WL or WG-05
(1) WS or WL or WG-04
(2) WS or WL or WG-03
(3) WS or WL or WG-02
(4) WS or WL or WG-01
(7) Military

4. How long have you worked at your current base?

(a) Less than 1 year
(b) 1 Year but less than 2
(c) 2 years but less than 3
(d) 3 years but less than 4
(e) 4 years but less than 5
(f) 5 years but less than 6
(g) 6 years but less than 7
(h) 7 years but less than 8
(i) 8 years but less than 9
(j) 9 years but less than 10
(k) 10 years but less than 11
(l) 11 years but less than 12
(m) 12 years but less than 13
(n) 13 years but less than 14
(o) 14 years but less than 15
(p) 15 years but less than 16
(q) 16 years but less than 17
(r) 17 years but less than 18
(s) 18 years but less than 19
(t) 19 years but less than 20
(u) 20 years but less than 21
(v) 21 years but less than 22
(w) 22 years but less than 23
(x) 23 years but less than 24
(y) 24 years but less than 25
(z) 25 years but less than 26
(1) 26 years but less than 27
(2) 27 years or more

5. Do you live on or off-base?

(a) On base
(b) Own off-base housing
(c) Rent off-base housing

6. What is your highest level of education now?

(a) Grammar school (did not graduate)
(b) Grammar school (no high school)
(c) High school (did not graduate)
(d) High school graduate (no college)
(e) Trade or technical school (no college)
(f) Some college but less than one year
(g) One year college, but less than two
(h) Two years college (associate degree)
(i) Two years college, but less than three
(j) Three years or more college, no degree
(k) Registered nurse diploma program
(l) College degree (BS, BA or equivalent except LL.B)
(m) Graduate work beyond bachelor degree (no master's degree)
(n) Master's degree
(o) Postgraduate work beyond master's degree
(p) Doctorate degree (includes LL.B, J.D., D.D.S., M.D., and D.V.M.)

7. Which one of the following do you consider yourself?

(a) Black
(b) Spanish Speaking Origin (Cuban, Puerto Rican, Mexican American, Spanish Descent)
(c) American Indian
(d) Asian Origin (Chinese, Japanese, Korean, Filipino, or Asian American)
(e) White (Other than Spanish Speaking Origin)
(f) Other

8. Do you live **within the city limits of any of the following cities?**

- Austin, Texas
- Colorado Springs, Colorado
- Dayton, Ohio
- Denver, Colorado
- Las Vegas, Nevada
- San Antonio, Texas
- Washington, D.C.

(a) Yes
(o) No

9. What is your marital status?

(a) Married and spouse is not a member of a military service
(b) Married and spouse is a member of a military service
(c) Never been married
(d) Divorced and not remarried
(e) Legally separated
(f) Widow/widower

10. How many dependents do you have? Do not include yourself.

(a) None
(b) One
(c) Two
(d) Three
(e) Four
(f) Five
(g) Six
(h) Seven
(i) Eight or more

11. What is your sex?

(a) Male
(b) Female

BLOCK I-A

A	B	C	D	E
Unimportant		Moderately Important		Very Important

The five-point scale above indicates various degrees of importance. From the scale, please select the letter which best represents the amount of importance you place on each of the following:

12. Your personal income level.

13. Building a large savings or investment account.

14. Owning your own home.

15. Owning your own car.

16. Owning more than one car.

17. The economic health of the metropolitan area around your base.

BLOCK I-B

A	B	C	D	E
Unsatisfactory		Satisfactory		Excellent

The five-point scale above indicates various degrees of satisfaction. From the scale, please select the letter which best describes each of the following:

18. Your personal income level.

19. The size of your savings or investment account.

20. Your personal transportation.

21. The economic health of the metropolitan area around your base.

22. Your housing.

BLOCK II-A

A	B	C	D	E
Unimportant		Moderately Important		Very Important

The five-point scale above indicates various degrees of importance. Regardless of whether you live on or off-base, please select the letter which best describes the amount of importance you place on each of the following:

23. Newspapers as a source of political information.

24. Television as a source of political information.

25. Radio as a source of political information.

26. Community participation in national politics.

27. Community participation in local (city and county) politics.

28. Your personal participation in local politics.

29. Local police protection.

30. Local fire protection.

31. A local welfare (city and county) program.

BLOCK II-B

A	B	C	D	E
Unsatisfactory		Satisfactory		Excellent

The five-point scale above indicates various degrees of satisfaction. Regardless of whether you live on or off-base, please select the letter which best describes each of the following:

32. Your metropolitan newspapers as a source of political information.

33. Your metropolitan television stations as a source of political information.

34. Your metropolitan radio stations as a source of political information.

35. Community (city and county) participation in local politics.

36. Community (city and county) participation in local politics.

37. Local police protection.

38. Local fire protection.

39. Local (city and county) welfare programs.

BLOCK III-A

A	B	C	D	E
Unimportant		Moderately Important		Very Important

The five-point scale above indicates various degrees of importance. From the scale, please select the letter which best represents the amount of importance you would place on each of the following when selecting a place to live or retire:

40. The amount of air pollution in the **metropolitan area.**

41. The amount of water pollution (rivers and lakes) in the **metropolitan area.**

42. The scenic beauty of the **metropolitan area.**

43. The amount of noise pollution in the local area.

44. The availability of recreational facilities (parks, trails, tennis courts, etc.).

45. The climate or general weather conditions in the **metropolitan area.**

BLOCK III-B

A	B	C	D	E
Unsatisfactory		Satisfactory		Excellent

The five-point scale above indicates various degrees of satisfaction. Please select the letter which best describes each of the following:

46. The air quality in the metropolitan area around your base.

47. The water quality (rivers, lakes) in the metropolitan area around your base.

48. The scenic beauty of the metropolitan area around your base.

49. The recreational facilities (parks, trails, tennis courts, etc.) in the metropolitan area around your base.

50. The climate or weather of the metropolitan area around your base.

BLOCK IV-A

A	B	C	D	E
Unimportant		Moderately Important		Very Important

The five-point scale above indicates various degrees of importance. From the scale, please select the letter which best represents the amount of importance you place on each of the following:

51. Local adult education programs (for high school credit).

52. Local adult education programs (college level programs).

53. Completing high school education.

54. Completing college education.

55. Completing graduate level education.

56. The availability and quality of local medical care.

57. The availability and quality of **metropolitan area medical facilities (hospitals, clinics, etc.).**

BLOCK IV-B

A	B	C	D	E
Unsatisfactory		Satisfactory		Excellent

The five point ecale above indicates various degrees of satisfaction. Regardless of whether you live on or off-base, please select the letter which best describes each of the following:

58. Local adult education programs (for high school credit).

59. Local adult education programs (for college credit).

60. Metropolitan area school districts.

61. Metropolitan area colleges and universities.

62. Metropolitan area community medical care.

63. Metropolitan area community medical facilities (hospitals, clinics, etc.).

BLOCK V-A

A	B	C	D	E
Unimportant		Moderately Important		Very Important

The five-point scale above indicates various degrees of importance. From the scale, please select the letter which best represents the amount of importance you place on each of the following:

64. The availability of full-time jobs in the metropolitan area around your base.

65. The availability of part-time jobs in the metropolitan area around your base.

66. Metropolitan area public transportation.

67. Equal opportunity for all races.

68. Equal opportunity for both sexes.

69. Living in a community which has a low crime rate.

70. The availability and quality of banks, retail, and service facilities.

71. The availability and quality of public libraries.

72. The availability of metropolitan area sporting events (professional, semi-professional, college).

73. The availability of metropolitan area cultural events (opera, theater, symphony, etc.).

BLOCK V-B

A	B	C	D	E
Unsatisfactory		Satisfactory		Excellent

The five-point scale above indicates various degrees of satisfaction. Regardless of whether you live on or off-base, please select the letter which best describes each of the following:

74. The availability of full-time jobs in the metropolitan area around your base.

75. The availability of part-time jobs in the metropolitan area around your base.

76. The availability of metropolitan area public transportation.

77. Equality among races in the metropolitan area around your base.

78. Sexual equality in the metropolitan area around your base.

79. The crime rate in the metropolitan area around your base.

80. The banks, retail, and service facilities in the metropolitan area around your base.

81. The local public libraries.

82. The metropolitan area sporting events (professional, semi-professional, college).

83. The metropolitan area cultural events (opera, theater, symphony, etc.).

APPENDIX B

COMPUTER PROGRAMS

Table 22

Data File Rearrangement Program

```
0010 CHARACTER *1 Q(93)
0020 CHARACTER *6 N,M
0030 CALL ATTACH(8,"78A81/DATA14;",1,0,,)
0040 CALL ATTACH(9,"78A81/DATA15;",1,0,,)
0050 CALL ATTACH(10,"78A81/DATA4;",3,0,,)
0060 DO 1 I=1,150
0070 READ(8,6,END=3)N,(Q(J),J=1,62)
0080 6 FORMAT (A6,70A1)
0090 REWIND 9
0100 DO 4 L=1,150
0110 READ(9,6,END=5)M,(Q(J),J=63,93)
0120 IF (N.EQ.M) GO TO 2
0130 4 CONTINUE
0140 2 WRITE (10,7)N,(Q(J),J=1,93)
0150 7 FORMAT(A6,62A1/A6,65A1)
0160 1 CONTINUE
0170 5 PRINT,"COULD NOT FIND RECORD ",N
0180 3 REWIND 10
0190 STOP
0200 END
```

Table 23

Typical Factor Analysis Program (Oblique Rotation)

```
0010##S,R(SL) :,8,16;;,16
0020$:IDENT:WP1308,AFIT/LSG WEBB JUOKINS
0030$:SELECT:SPSS/SPSS
0040$:LIMITS:98,99K,10K,15K
0050RUN NAME; QUESTIONNAIRE QUALITY OF LIFE
0060PRINT BACK;YES
0070FILE NAME;QUALITY OF LIFE
0080VARIABLE LIST;Q12 TO Q83
0220INPUT MEDIUM;OISK
0230N OF CASES;UNKNOWN
0530RECODE;Q12 TO Q83('A'=1)('B'=2)('C'=3)('D'=4)('E'=5)
0531;(ELSE=99)/
0550INPUT FORMAT;FIXEO(11X,51A1/21A1)
0560MISSING VALUES;Q12 TO Q83(99)
0570READ INPUT DATA
0580FACTOR;VARIABLES=Q12 TO Q83/
0585;NFACTORS=13/
0590;ROTATE=OBLIQUE
06100PTIONS;2,5
0620STATISTICS;ALL
0630FINISH
0640$:DATA:08
0650$:SELECTA:DATA1
0750$:ENDJOB
```

Table 24

Typical Frequencies Program

```
0010##S,R(SL) :,8,16;;,16
0020$:IDENT:WP1308, AFIT/LSG/78A WEBB JUDKINS
0030$:SELECT:SPSS/SPSS
0040RUN NAME; DEMOGRAPHIC DATA
0050VARIABLE LIST;Q001 TO Q083
0060INPUT FORMAT;FIXED(62A1/21A1)
0070N OF CASES;155
0080INPUT MEDIUM;CARD
0090VAR LABELS;Q001,BASE/
0091,Q002,RANK/
0100;Q003,CIVILIAN/
0110;Q004,TIME ON STATION/
0120;Q005,HOUSING/
0130;Q006,EDUCATION LEVEL/
0140;Q007,RACE/
0150;Q008,CITY LIMITS/
0160;Q009,MARITIAL STATUS/
0170;Q010,NO OF DEPENDENTS/
0180;Q011,SEX/
0190;Q012,INCOME 1A/
0200;Q013,SAVINGS 1A/
0210;Q014,OWN HOME 1A/
0220;Q015,OWN CAR 1A/
0230;Q016,OWN TWO CARS 1A/
0240;Q017,ECON HEALTH 1A/
0250;Q018,INCOME 1B/
0260;Q019,SAVINGS 1B/
0270;Q020,PERS TRANSP 1B/
0280;Q021,ECON HEALTH 1B/
0290;Q022,HOUSING 1B/
0300;Q023,NP POL INF 2A/
0310;Q024,TV POL INF 2A/
0320;Q025,RADIO POL INF 2A/
0330;Q026,CM PAR N POL 2A/
0340;Q027,CM PAR L POL 2A/
0350;Q028,PE PA L POL 2A/
0360;Q029,LO POLICE 2A/
0370;Q030,LO FIRE 2A/
0380;Q031,LWEATHER 2A/
```

Table 24 (continued)

```
0390;Q032,NP POL INF 2B/
0400;Q033,TV POL INF 2B/
0410;Q034,RADIO POL INF 2B/
0420;Q035,CM PAR L POL 2B/
0430;Q036,CM PAR L POL 2B/
0440;Q037,LO POLICE 2B/
0450;Q038,LO FIRE 2B/
0460;Q039,LWEATHER 2B/
0470;Q040,AIR POL 3A/
0480;Q041,WATER POL 3A/
0490;Q042,SENIC BEAU 3A/
0500;Q043,NOISE POL 3A/
0510;Q044,REC FAC 3A/
0520;Q045,CLIMATE 3A/
0810;Q046,AIR QUAL 3B/
0820;Q047,WATER QUAL 3B/
0830;Q048,SENIC BEAU 3B/
0840;Q049,REC FAC 3B/
0850;Q050,CLIMATE 3B/
0860;Q051,LO AD HS 4A/
0870;Q052,LO AD COL 4A/
0880;Q053,COMP HS 4A/
0890;Q054,COMP COL 4A/
0900;Q055,COMP GRAD 4A/
0910;Q056,AV QUAL MED CAR 4A/
0920;Q057,AV QUAL MED FAC 4A/
0930;Q058,LO AD HS 4B/
0940;Q059,LO AD COL 4B/
0950;Q060,MET HS 4B/
0960;Q061,MET COL UNIV 4B/
0970;Q062,MET MED CARE 4B/
0980;Q063,MET MED FAC 4B/
0990;Q064,AV FT JOBS 5A/
1000;Q065,AV PT JOBS 5A/
1010;Q066,MET PUB TRANS 5A/
1020;Q067,EO RACE 5A/
1030;Q068,EO SEX 5A/
1040;Q069,CRIME RATE 5A/
1050;Q070,AV BK RET SV 5A/
```

Table 24 (continued)

```
1060;Q071,AV QUAL PUB LIB 5A/
1070;Q072,AV MET SPORT 5A/
1080;Q073, AV MET CUL 5A/
1090;Q074,AV FT JOBS 5B/
1100;Q075,AV PT JOBS 5B/
1110;Q076,AV MET PB TRANS 5B/
1120;Q077,EO RACE 5B/
1130;Q078,EO SEX 5B/
1140;Q079,MET CRIME RATE 5B/
1150;Q080,BK RET SV FAC 5B/
1160;Q081,LO PB LIB 5B/
1170;Q082,MET SPORTS 5B/
1180;Q083,MET CULTURE 5B
1190MISSING VALUES;Q001 TO Q083 (0)
1200RECODE;Q001('A'=1)('B'=2)('C'=3)('D'=4)('E'=5)('F'=6)
1210;('G'=7)('H'=8)(' '=0)(ELSE=0)
1220RECODE;Q002('A','B','C','D','E','F'=1)
1230;('G','H','I','J','K','L','M','N','O','P'=2)(' '=0)(ELSE=0)
1250RECODE;Q003 TO Q082('A'=1)('B'=2)('C'=3)('D'=4)('E'=5)
1260;('F'=6)('G'=7)('H'=8)('I'=9)('J'=10)('K'=11)('L'=12)('M'=13)
1270;('N'=14)('O'=15)('P'=16)('Q'=17)('R'=18)('S'=19)('T'=20)
1280;('U'=21)('V'=22)('W'=23)('X'=24)('Y'=25)('Z'=26)
1300;('1'=27)('2'=28)('7'=7)(' '=0)(ELSE=0)
1310VALUE LABELS;Q001 (1) ANDREWS (2) KELLY (3) LOWRY
1320; (4) WRIGHT PATT (5) BERGSTROM (6) NELLIS (7) PETERSON/
1330;Q002 (1) OFFICER (2) ENLISTED/
1340;Q004 (1) 0 TO 1 (2) 1 TO 2 (3) 2 TO 3 (4) 3 TO 4 (5) 4 TO 5
1350; (6) 5 TO 6 (7) 6 TO 7 (8) 7 TO 8 (9) 8 TO 9 (10) 9 TO 10
1360; (11) 10 TO 11 (12) 11 TO 12 (13) 12 TO 13 (14) 13 TO 14
1370; (15) 14 TO 15 (16) 15 TO 16 (17) 16 TO 17 (18) 17 TO 18
1380;(19) 18 TO 19 (20) 19 TO 20 (21) 20 TO 21 (22) 21 TO 22
1390; (23) 22 TO 23 (24) 23 TO 24 (25) 24 TO 25  (26) 25 TO 26
1400; (27) 26 TO 27 (28) 27 TO 28/
1410;Q005 (1) ON BASE (2) OWN OFF BASE (3) RENT OFF BASE/
1420;Q006 (1) GR SC N COMP (2) GR SC N HS (3) HS N GRAD
1430; (4) HS GRAD (5) TEC SCH NO COL (6) LT 1 YR COL
1440; (7)  1 TO 2 YR COL (8) ASSO DEG (9) 2 TO 3 YR COL
1450; (10) OVER 3 YR COL N DEG (11) REG NURSE (12) BS BA
1460; (13) GRAD N DEG (14) MAST DEG (15) POST MAST  N DEG
```

Table 24 (continued)

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1470; (16) DOCT DEG/
1480;Q007 (1) BLACK (2) SPANISH (3) AM INDIAN (4) ASIAN
1490; (5) WHITE (6) OTHER/
1500;Q008 (1) YES (2) NO/
1510;Q009 (1) SPOUSE NON MIL (2) MIL SPOUSE (3) NEVER MARRIED
1520; (4) DIV SINCLE (5) LEC SEPARATED (6) WIDOW WIDOWER/
1530;Q010 (1) NONE (2) ONE (3) TWO (4) THREE (5) FOUR (6) FIVE
1540; (7) SIX (8) SEVEN (9) EICHT OR MORE/
1550;Q011 (1) MALE (2) FEMALE/
1560;Q012 TO Q017 (1) UNIMPORTANT (2) UN TO MOD IMP
1570; (3) MOD IMPORTANT (4) MOD TO VERY IMPT
1580; (5) VERY IMPORTANT/
1590;Q018 TO Q022 (1) UNSATISFACTORY (2) UN TO SAT
1600; (3) SATISFACTORY (4) SAT TO EXCEL (5) EXCELLENT/
1610;Q023 TO Q031 (1) UNIMPORTANT (2) UN TO MOD IMPT
1620; (3) MOD IMPORTANT (4) MOD TO VERY IMPT (5) VERY IMPORTANT/
1630;Q032 TO Q039 (1) UNSATISFACTORY (2) UN TO SAT
1640; (3) SATISFACTORY (4) SAT TO EXCEL (5) EXCELLENT/
1650;Q040 TO Q045 (1) UNIMPORTANT (2) UN TO MOD IMP
1660; (3) MOD IMPORTANT (4) MOD TO VERY IMPT (5) VERY IMPORTANT/
1670;Q046 TO Q050 (1) UNSATISFACTORY (2) UN TO SAT (3) SATISFACTORY
1680; (4) SAT TO EXCEL (5) EXCELLENT/
1690;Q051 TO Q057 (1) UNIMPORTANT (2) UN TO MOD IMP
1700; (3) MOD IMPORTANT (4) MOD TO VERY IMPT (5) VERY IMPORTANT/
1710;Q058 TO Q063 (1) UNSATISFACTORY (2) UN TO SAT (3) SATISFACTORY
1720; (4) SAT TO EXCEL (5) EXCELLENT/
1730;Q064 TO Q073 (1) UNIMPORTANT (2) UN TO MOD IMPT
1740; (3) MOD IMPORTANT (4) MOD TO VERY IMPT (5) VERY  IMPORTANT/
1750;Q074 TO Q083 (1) UNSATISFACTORY (2) UN TO SAT (3) SATISFACTORY
1760; (4) SAT TO EXCEL (5)  EXCELLENT/
1761*SELECT IF;(Q001 EQ 5 AND Q005 EQ 3)
1770FREQUENCIES;GENERAL=Q001 TO Q083
1780OPTIONS;3,8,9
1790STATISTICS;1,2,3,4,9,10,11
1800READ INPUT DATA
1810$:SELECTA:78A81/DATA1
1820FINISH
1830$:END JOB
```

APPENDIX C

DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Table 25

Characteristics of the Respondents

Characteristics	Bergstrom AFB		Lowry AFB	
	No.	%	No.	%
Number of Respondents	66	-	85	-
Number of Officers	12	18.2	6	7.0
Number of Enlisted Personnel	53	80.3	78	91.8
Unknown Rank	1	1.5	1	1.2
Time on Station (years)				
0 to 1	16	24.2	20	23.5
1 to 2	18	27.3	19	22.4
2 to 3	14	21.2	18	21.2
3 to 4	10	15.2	14	16.5
4 to 5	4	6.1	7	8.2
5 to 6	1	1.5	1	1.2
6 to 7	2	3.0	5	5.9
7 to 8	1	1.5	1	1.2
Housing				
On-base	21	20	20	23.5
Own off-base	26	33	33	38.8
Rent off-base	19	32	32	37.6

Table 25 (continued)

Characteristics	Bergstrom AFB		Lowry AFB	
	No.	%	No.	%
Education Level				
No high school degree	1	1.5	2	2.4
High school graduate	20	30.3	16	18.8
Technical school (no college)	1	1.5	2	2.4
Less than one year of college	14	21.2	19	22.4
One to two years of college	7	10.6	14	16.5
Possessed an associate degree	1	1.5	3	3.5
Two to three years of college	5	7.6	9	10.6
Over three years of college	2	3.0	8	9.4
College degree	4	6.1	4	4.7
Some graduate work	8	12.1	4	4.7
Master's degree	3	4.5	3	3.5
Post graduate work	0	0	1	1.2
Race				
Black	8	12.1	4	4.7
Spanish speaking	4	6.1	4	4.7
American Indian	1	1.5	2	2.4
Asian	1	1.5	2	2.4
White	50	75.8	70	82.4
Other	2	3.0	3	3.5

Table 25 (continued)

Characteristics	Bergstrom AFB		Lowry AFB	
	No.	%	No.	%
Housing Location				
Within city limits	40	60.6	47	55.3
Outside city limits	26	39.4	38	44.7
Marital Status				
Married	50	75.8	67	78.8
Single	115	22.7	16	18.9
Legally separated	1	1.5	2	2.4
Number of Dependents				
Two or fewer	44	66.7	44	51.8
Three or four	17	25.7	33	38.9
More than four	5	7.6	8	9.4
Sex				
Male	62	93.9	79	92.9
Female	4	6.1	6	7.1

APPENDIX D

FACTOR LOADINGS

Table 26

Factor Loadings

Question	Component	1	2	3	4	5	6	7	8	9	10	Communality
12	1A								.40173			.27899
13	1A								.44232			.30283
14	1A								.60849			.42479
15	1A								.59930			.41101
16	1A								.63754			.44685
17	1A								.37162			.34029
18	1B					.56182						.35582
19	1B					.37674						.26069
20	1B					.29397						.14763
21	1B					.29363						.20440
22	1B					.37849						.28690
23	2A			.68753								.55373
24	2A			.62899								.59253
25	2A			.67168								.57314
26	2A			.65029								.61226

Table 26 (continued)

Question	Component	1	2	3	4	5	6	7	8	9	10	Communality
27	2A			.64786								.56747
28	2A			.67304								.59547
29	2A							.57880				.62317
30	2A							.61048				.64245
31	2A							.41135				.39090
32	2B									.80920		.70487
33	2B									.79744		.66573
34	2B									.70008		.56952
35	2B									.47267		.36612
36	2B									.46632		.37493
37	2B				.27031							.40785
38	2B				.25099							.35757
39	2B									.56073		.43630
40	3B										.85337	.65687
41	3B										.77957	.63046
42	3B										.55594	.43636
43	3A										.59711	.39653

Table 26 (continued)

Question	Component	1	2	3	4	5	6	7	8	9	10	Communality
44	3A										.47041	.42022
45	3A						.29243					.23257
46	3B						.60295					.53131
47	3B						.73189					.64971
48	3B						.67176					.67983
49	3B						.60294					.53267
50	3B						.46685					.36229
51	4A							.37447				.50691
52	4A										.28949	.49719
53	4A							.46731				.31399
54	4A	.22378										.32600
55	4A		.28405									.42317
56	4A	.64865										.61752
57	4A	.73540										.64159
58	4B	.49364										.56968
59	4B	.56459										.57929
60	4B	.37286										.49759

Table 26 (continued)

Question	Component	1	2	3	4	5	6	7	8	9	10	Communality
61	4B	.57498										.55030
62	4B	.62214										.62800
63	4B	.64672										.56235
64	5A				.55550							.37992
65	5A				.57883							.46458
66	5A				.61667							.54657
67	5A						.48970					.58536
68	5A						.46240					.58391
69	5A						.31970					.43015
70	5A				.31624							.45176
71	5A				.49094							.56958
72	5A				.37913							.44684
73	5A				.41957							.42760
74	5B		.51207									.38538
75	5B		.58379									.43301
76	5B		.52957									.48839

Table 26 (continued)

Question	Component	1	2	3	4	5	6	7	8	9	10	Communality
77	5B		.40066									.58501
78	5B		.48781									.53815
79	5B					.43961						.26829
80	5B		.46938									.55341
81	5B		.41513									.47415
82	5B		.61055									.52639
83	53		.48035									.40971
Eigenvalues		11.59759	5.48630	3.31870	2.74678	2.4670	2.13014	1.88977	1.78301	1.56813	1.41764	
% Variance Explained		33.9	16.0	9.7	8.0	6.6	6.2	5.5	5.2	4.6	4.1	
Cumulative Variance Explained		33.9	50.0	59.7	67.7	74.3	80.5	86.0	91.3	95.9	100	

APPENDIX E

IMPORTANCE RATINGS

Table 27

Importance Ratings of All of the Bergstrom Responses

Component	Mean Response	Rating Range
Economic	3.93	Moderately to Very Important
Political	3.53	Moderately to Very Important
Environmental	4.30	Very Important
Health and Education	4.16	Moderately to Very Important
Social	4.15	Moderately to Very Important

Table 28

Importance Ratings of the Enlisted Personnel at Bergstrom AFB

Component	Mean Response	Rating Range
Economic	3.99	Moderately to Very Important
Political	3.53	Moderately to Very Important
Environmental	4.35	Very Important
Health and Education	4.24	Very Important
Social	4.17	Moderately to Very Important

Table 29

Importance Ratings of the Minority Groups at Bergstrom AFB

Component	Mean Response	Rating Range
Economic	4.09	Moderately to Very Important
Political	3.55	Moderately to Very Important
Environmental	4.50	Very Important
Health and Education	4.42	Very Important
Social	4.46	Very Important

Table 30

Importance Ratings of the Non-Minority Group at Bergstrom AFB

Component	Mean Response	Rating Range
Economic	3.88	Moderately to Very Important
Political	3.52	Moderately to Very Important
Environmental	4.24	Very Important
Health and Education	4.08	Moderately to Very Important
Social	4.05	Moderately to Very Important

Table 31

Importance Ratings of All of the Lowry Respondents

Component	Mean Response	Rating Range
Economic	3.89	Moderately to Very Important
Political	3.23	Moderately to Very Important
Environmental	4.32	Very Important
Health and Education	4.12	Moderately to Very Important
Social	4.02	Moderately to Very Important

Table 32

Importance Ratings of the Enlisted Personnel at Lowry AFB

Component	Mean Response	Rating Range
Economic	3.92	Moderately to Very Important
Political	3.28	Moderately to Very Important
Environmental	4.30	Very Important
Health and Education	4.11	Moderately to Very Important
Social	4.05	Moderately to Very Important

Table 33

Importance Ratings of Minority Groups at Lowry AFB

Component	Mean Response	Rating Range
Economic	4.04	Moderately to Very Important
Political	3.38	Moderately to Very Important
Environmental	4.21	Moderately to Very Important
Health and Education	4.38	Very Important
Social	4.17	Moderately to Very Important

Table 34

Importance Ratings of the Non-Minority Group at Lowry AFB

Component	Mean Response	Rating Range
Economic	3.86	Moderately to Very Important
Political	3.25	Moderately to Very Important
Environmental	4.35	Very Important
Health and Education	4.07	Moderately to Very Important
Social	3.99	Moderately to Very Important

SELECTED BIBLIOGRAPHY

A. REFERENCES CITED

1. Cardinale, Captain Richard O., and Captain Ronald E. Kohn, USAF. "A Comparative Study of the Quality of Life Indications for Major Air Force Bases in the United States." Unpublished paper, AFIT/SL, Wright-Patterson AFB OH, 1977.

2. Cook, Captain Sharla J., and First Lieutenant David R. Wilkey, USAF. "Social Problems of Enlisted Women in United States Air Force Craft Skills." Unpublished master's thesis. LSSR 6-77A, AFIT/SL, Wright-Patterson AFB OH, 1977.

3. Emory, C. William. Business Research Methods. Homewood IL: Richard D. Irwin, Inc., 1976.

4. Engel, Major John E. "A Study of the Relationship Between Worker Attitudes and Organizational Effectiveness in an Air Logistics Center Maintenance Directorate." Unpublished technical report, AU-AFIT-LS-8-77, AFIT/SL, Wright-Patterson AFB OH, 1971.

5. Environmental Reporter. Bureau of National Affairs, The National Environmental Policy Act, 42 USC 4341, Amended by PL 94-52, July 3, 1975 and PL 94-83, August 9, 1975.

6. _____. Bureau of National Affairs, Executive Order 11514, Protection and Enhancement of Environmental Quality as amended by Executive Order 11991, May 24, 1977.

7. _____. Bureau of National Affairs, Department of the Interior, Bureau of Indian Affairs, before the House Appropriations Subcommittee on the Department of the Interior and related agencies, May 28, 1976.

8. _____. Bureau of National Affairs, Department of the Interior, Fish and Wildlife Service, before the House Appropriations Subcommittee on the Department of the Interior and related agencies, September 24, 1976.

9. _____. Bureau of National Affairs, Appalachian Regional Commission, before the House Appropriations Subcommittee on Public Works, November 14, 1975.

10. Gardner, Paul Leslie. "Scales and Statistics," Review of Educational Research. Vol. 45, No. 1 (Winter 1975), pp. 43-57.

11. Helmstadter, G. C. Research Concepts in Human Behavior. New York: Meredith Corporation, 1970.

12. Henriksen, Lester H., and Gary D. Vest, AIP. "Mission Effectiveness and Base Livability," Air Force Engineering and Services Quarterly. Vol. 17, No. 4 (November, 1976), p. 6.

13. LoPresti, Major Peter, PE, and William L. Kollman, PE. "Monument of People Oriented Construction," Air Force Engineering and Services Quarterly. Vol. 17, No. 4 (November, 1976), p. 7.

14. Morison, Samuel E., Henry Steele Commager, and William E. Leuchtenburg. The Growth of the American Republic. Vol. 2. 6th ed. New York: Oxford University Press, 1969.

15. Thompson, Major General Robert C., USAF. "From the Director: A "Total Environment" Approach to Our Jobs," Air Force Engineering and Services Quarterly. Vol. 17, No. 4 (August, 1976), p. 1.

16. _____. "From the Director: Keys to Success," Air Force Engineering and Services Quarterly. Vol. 18, No. 3 (August, 1977), p. 1.

17. _____. "From the Director: New Partners and a Name Change," Air Force Engineering and Services Quarterly. Vol. 16, No. 3 (August, 1975), p. 1.

18. Ulsamer, Edger. "An Air Force Almanac," Air Force Magazine, (May, 1977), pp. 132-145.

19. U.S. Environmental Protection Agency. The Quality of Life Concept. Washington: Government Printing Office, 1973.

20. _____. Quality of Life Indicators in U.S. Metropolitan Areas: 1970. Washington: Government Printing Office, 1975.

21. Van Hyning, Gretchen. Community Planner, Air Base Planning Division, Directorate of Engineering and Services, HQ USAF/PREVX, Pentagon, Washington, 26-27 September 1977.

B. RELATED SOURCES

Harman, Harry H. Modern Factor Analysis. Chicago IL: The University of Chicago Press, 1962.

Mathis, Captain Wayne R., USAF. "A Study of Military-Civil Service Differences in Quality of Life." Unpublished master's thesis. AFIT/EN, Wright-Patterson AFB OH, 1976.

Pfaffenberger, Roger C., and James H. Patterson. Statistical Methods for Business and Economics. Homewood IL: Richard D. Irwin, Inc., 1977.

Stober, Gerhard J., and Dieter Schumacher. Technology Assessment and Quality of Life. Amsterdam, The Netherlands: Elsevier Scientific Publishing Company, 1973.